Illustration: Alfredo Ricaud/Tom Nikosey Design

COMPUTER LEARNING MONTH
OCTOBER'87

A personal computer is a tool
for exploring life's learning adventures.

The activities listed here introduce the computer—including computer terminology, languages, hardware and software, social implications, and numerous applications. Implemented with zest and imagination, these activities will stimulate curiosity and encourage learning.

**How to Use the Lesson Plan Grid:**
Find your grade level and curriculum area. Many of the activities can be done without a computer, but to fully learn about computers, computers must be used. The activities that require computers are printed in maroon. You may not have the hardware and software necessary to complete all of these activities. That's okay. Look for the activities marked with a ★. These are questions for research, thought, and discussion. Our goals are to present a wide variety of computer applications as challenges for Computer Learning Month and to acquaint you with activities you may want to add to your curriculum.

**Make a copy of the lesson plans:**
So you can hang the poster on your wall, we have arranged the lesson plans so they can be easily copied. You have our permission to make as many copies as you wish for yourself and your friends.

| | Grades K–3 | Grades 4–6 | Grades 7–9 | Grades 10–12 | |
|---|---|---|---|---|---|
| Language Arts | 1) Write a step-by-step description of how to make a peanut-butter-and-jelly sandwich. Imagine that you are writing the directions for a robot or alien who has never seen a peanut-butter-and-jelly sandwich before.<br>Next, make sure everyone has some peanut butter, jelly, bread, and necessary silverware.<br>Now, read the directions aloud, step by step, and make the sandwich EXACTLY the way the directions tell you. Don't make any changes.<br>★ Did you make a sandwich or a mess? Now you can eat what you made.<br>★ Is it easy to write clear directions?<br><br>2) Define, use, and spell basic computer terms:<br>• computer • disk drive<br>• monitor • Return key (Enter key)<br>• keyboard • space bar<br>• disk • save<br>• printer • load<br><br>3) Use a computer program to write a story or make a card for someone special.<br>Print it out on the printer. | 1) Discuss the advantages and disadvantages of writing with paper and pencil versus word processing.<br><br>2) Use a word processor to write a story.<br>Print it.<br>Edit (correct and improve) your printed story.<br>Go back to the computer and make the changes.<br>Print out the final copy.<br>★ Which is easier, to rewrite your paper-and-pencil version or to edit and reprint your computer version?<br>★ Which method do you prefer?<br><br>3) September 17, 1987, is the 200th birthday of the United States Constitution.<br>★ Research one of the framers of the Constitution.<br>Use a word processor to write a report on the framer's contribution to the Constitutional Convention, noting how today's technology might have changed his role or activities. | 1) Discuss five reasons for using a word processor rather than a typewriter in school, business, and industry.<br><br>2) Discuss and demonstrate the use of desktop accessories that enhance word processing. Be sure to include a spelling checker, thesaurus, grammar checker, calendar, and calculator.<br>★ What are the strengths of these accessories? The weaknesses?<br>★ Dream up an additional accessory that you would like to add.<br><br>3) Ask the librarian how technology is enhancing the library.<br>★ How are researching techniques changing?<br>★ How often is information in books (and in data bases) updated?<br>★ How has technology affected the way libraries share information and resources? | 1) Invite several administrative assistants to discuss the advantages of word processing and how it has changed their daily tasks.<br>★ Which activities are done using a word processor and which are better suited to a typewriter?<br><br>2) Investigate telecommunications.<br>★ What is it?<br>★ Who uses it?<br>★ What services does it provide?<br>★ What is e-mail?<br>★ Why are individuals and businesses increasingly using e-mail rather than the phone or traditional mail services?<br>Go on-line with a telecommunications service to communicate electronically with another high school or to research a topic using an on-line data base. | Language Arts |
| Social Studies | 1) List several ways computers are used in everyday life:<br>• at home (microwave, digital watch, TV)<br>• at school (practicing math, writing stories)<br>• at work (electronic cash registers and banking)<br>Schedule a field trip to a bank or store that uses computers, or invite a guest speaker to discuss the use of computers in business and industry.<br><br>2) Take a survey of the number of classmates whose parents use computers at work and at home.<br>Chart the results, with or without the computer. | 1) Identify ways that computers are used to help you and your family in:<br>• banks • supermarkets<br>• fast-food restaurants • hospitals<br>• newspapers • schools<br>• government<br>(examples include automatic tellers and talking cash registers)<br><br>2) Investigate how computer graphics are used in business and industry. Discuss ways that artists and musicians use computers. Identify computer programs that encourage you to explore graphing, art, and music.<br>Try out one or two of these programs.<br>★ What did you find better or worse about doing the activity on the computer instead of using paper and pencil or other tools?<br><br>3) September 17, 1987, is the 200th birthday of the United States Constitution.<br>★ Research the writing of the Constitution. If it were being written today, how would technology affect the Constitutional Convention? Consider word processing, radio, and TV. | 1) Investigate the importance of computers in business and industry.<br>Describe how computers are used by various companies.<br>★ What information do we give the computer?<br>★ What information does the computer give us?<br>★ How is the information used by the company?<br><br>2) Discover where and how computer simulations are used in problem-solving situations.<br>★ Do computers make decisions?<br>Use a computer simulation.<br>★ How is it like the actual event? How is it different?<br>★ When is a simulation preferable to the real thing?<br><br>3) Research how computers are used for gathering, processing, and retrieving information.<br>Define and discuss data-base management and its use in business and industry.<br>Try out a data-base-management program to see how information is entered, stored, and retrieved.<br>★ What is the difference between selecting and sorting information?<br>Give examples of when you would use each.<br>Describe how data-base programs help with decision making and drawing conclusions in school and at work. | 1) Identify careers that rely on or relate to computer development and use.<br><br>2) Investigate the value of computer skills for future employment.<br>★ Which computer skills do you need to learn to be an asset to your employer?<br>★ Are there any computer skills that all professionals should develop?<br>★ Why are spreadsheets, data bases, and word processors the programs most commonly used in business?<br>Observe someone using one or more of these applications.<br>★ What are the advantages over other methods of doing the same task?<br>★ Are there disadvantages?<br><br>3) List tasks that were once done manually but are now performed by computers.<br>★ How has this affected employment?<br>★ Imagine future computer uses. How will they affect the job market?<br><br>4) Discuss how the computer assists social scientists in understanding and managing information. | Social Studies |
| Science | 1) Record the weather for a week.<br>Make a chart, with or without a computer graphing program, representing the number of rainy, sunny, snowy, and cloudy days.<br>Discuss how computers are used in forecasting and reporting the weather.<br>Invite a meteorologist to talk about his or her job and the use of technology in meteorology.<br><br>2) As a group, take a survey of what everyone ate for breakfast. Record how many ate something from each food group: meat, dairy, bread and grains, and fruits and vegetables.<br>Use a computer program to graph the results. By using a bar graph or pictograph, you can easily see if the group had a balanced breakfast.<br>★ Did you or the group eat too much or too little from one food group?<br>Discuss the importance of a balanced diet. | 1) List and discuss reasons (including speed, repeatability, memory, storage capacity, and accuracy) why the computer is an important tool for science.<br><br>2) List and discuss tasks that are appropriate for a computer. Examples: predicting the weather, helping fly airplanes.<br>★ Which tasks are inappropriate? Why?<br><br>3) Outline the scientific method: observe, generalize, research and record, and verify.<br>Discuss how computers are used in each phase of the investigation.<br>Use a computer to assist in one or more of the steps of the scientific process. | 1) Research the ways scientists use computers for gathering, storing, and retrieving information.<br><br>2) Turn your computer into a science laboratory by attaching sensors that measure and record light, temperature, speed, response time, and other phenomena.<br>Use the computer to record or simulate experiments.<br>Graph the results.<br><br>3) Use a computer simulation to learn about a topic in science.<br>★ Why is it sometimes better to use a simulation than to actually experience the event?<br>★ What activities are usually done only by simulation?<br>★ Are there any experiments or events that can (or should) be tested or tried only with a simulation? What are they? Why? | 1) Discuss how the computer assists scientists in understanding science.<br>★ How is a computer used in predicting, interpreting, and evaluating information?<br><br>2) Explore how computers are used in testing and evaluating hypotheses.<br><br>3) Use a computer as a tool to assist in the scientific process.<br>Begin with a data-base program, first recording and then organizing data.<br>Next, graph the information to highlight any relationships between the data.<br>★ Do any trends appear?<br>★ Can you form a hypothesis?<br>Using the data, attempt to prove or disprove your hypothesis.<br>★ Can you draw any conclusions?<br><br>4) Using a spreadsheet, build a mathematical model for a scientific formula. (Scientific concepts that can be expressed by a mathematical formula can be expressed with a spreadsheet.)<br>Enter data into the spreadsheet.<br>★ How does the spreadsheet format encourage creative thinking and hypothesizing? (A scientist can ask "What if?" and get immediate feedback.) | Science |
| Mathematics | 1) Discuss robots.<br>★ Do robots exist?<br>★ Who has seen a robot?<br>★ What can robots do? What can't robots do?<br>★ If you could teach a robot to do one thing, what would it be?<br>Make a maze with chairs, blocks, or masking tape.<br>Acting as a robot who understands only RIGHT, LEFT, FORWARD, and BACK commands, take turns moving through the maze, and direct others through the maze.<br>★ Is it harder to be the robot or to give the directions? Why?<br><br>2) Practice your math skills on the computer.<br>★ What did you like about the computer as a tutor?<br>★ What didn't you like? | 1) Describe and discuss the advantages and disadvantages of using paper and pencil versus a calculator versus a computer for computation and problem solving.<br>★ Which method is fastest?<br>★ Which is most reliable?<br>★ Which do you prefer? Why?<br><br>2) Use the computer to calculate the answers to a page of math problems.<br>Example: PRINT 4*6 (RETURN)<br>PRINT 25/5 (RETURN)<br>★ Does the computer make the work easier or harder?<br>★ Are you sure the answers are correct?<br>★ What does it mean when someone says "Computer mistakes are our mistakes"? | 1) Describe the differences between analog and digital computers.<br>Give examples of each.<br><br>2) Describe the purpose of computer languages.<br>★ What does a computer language do?<br>List several different languages.<br>★ Can they be used interchangeably, or does each have strengths and weaknesses that make it more appropriate for specific applications?<br>★ Why learn a computer language?<br>Write a short program using the language of your choice.<br>Compare it with another student's program.<br>★ What qualities do all languages share? What makes them different from one another?<br><br>3) Describe what computer software does.<br>★ What are the advantages of buying software? Of writing your own software?<br><br>4) Investigate the various ways a computer can assist in learning and doing mathematics, for students and for mathematicians.<br>Use a program designed to teach or practice a math skill.<br>★ How does the computer activity compare to the noncomputer approach to learning the skill? | 1) Describe the techniques computers use to process information (searching, selecting, sorting, inserting, deleting, updating, summarizing).<br>★ What is an appropriate application for each? (Example: locating specific information—selecting.)<br><br>2) Use a computer to accomplish a mathematical task that would be time-consuming or difficult without the computer. (Example: Research interest rates for a car loan and then compute monthly payments based on a specific car cost and interest rate. Using a spreadsheet, note the total interest and principal paid.)<br><br>3) Define "algorithm" and explain how the computer uses or solves algorithms.<br>Translate an algebraic formula into spreadshee. syntax.<br>Translate the same formula into BASIC or Pascal.<br>Discuss the advantages and disadvantages of each. | Mathematics |


*Computer Learning Month Sponsors*

A+
Activision
Advanced Ideas
Apple Computer, Inc.
Britannica Software (Designware,® EduWare,® Blue Chip Software™)
Broderbund Software, Inc.
Compu-Teach
Compute! Publications
Computer Software Service
B. Dalton Software Etc.
Davidson & Associates, Inc.
DLM, Inc.
Education Systems Corporation
Focus Media
Great Wave Software
Grolier Electronic Publishing
Hartley Courseware
IBM Corporation
InCider
The Learning Company
Learning Technologies
Logo Computer Systems, Inc.
Mindscape, Inc.
Peter Li, Inc.
Random House Media
RUN
Scholastic, Inc.
Simon & Schuster
Soft-Kat, Inc.
Software Publishers Association
Spinnaker Software
Springboard Software, Inc.
Tandy Corporation
THE Journal
Weekly Reader Family Software

Contributors:
Joan Junger, Grimes Elementary School—Oklahoma
Linda Curran, Watertown High School—Massachusetts
E. Dee Otterstrom, Holland Hall Middle School—Oklahoma